Background for a comparative analysis of JE vaccination strategies for U.S. travelers to Asia

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JE among U.S. travelers

- Risk of JE for most travelers is very low but varies based on travel destination, duration, season, and activities
- From 1992–2017, 12 JE cases reported among US travelers or expatriates (<1 case per year)
- Among the 12 cases
  - 8 cases: Duration of travel ≥1 month
  - 3 cases: Shorter travel but rural exposure for ≥1 night
  - 1 case: No information
- Low case numbers likely not related to JE vaccination
  - 11–28% of adult higher risk travelers vaccinated*
  - 2–4% of adult lower risk travelers vaccinated*

*Duffy MR. J Travel Med 2013; Deshpande BR. Am J Trop Med Hyg 2014

Current ACIP recommendations for prevention of JE among travelers

- For all travelers to Asia, discuss risks of JE and need to take precautions to avoid mosquito bites
- For some travelers, JE vaccine can further reduce the risk for infection
- Providers should assess a traveler's risk based on their itinerary (i.e., location, duration, season, and activities)
- Decision whether to vaccinate should weigh:
  - Risk for JE
  - High morbidity and mortality of JE
  - Low probability of serious adverse events
  - Vaccine cost

Current ACIP recommendations for JE vaccine

- JE vaccine recommended for travelers who plan to spend a month or longer in endemic areas during JE virus transmission season, including expatriates and recurrent travelers
- JE vaccine should be considered for shorter-term travelers to endemic areas if itinerary will increase the risk of JE virus exposure
- JE vaccine not recommended for short-term travelers whose visit restricted to urban areas or times outside of transmission season

CDC. MMWR Recomm Rep 2010.

Risk groups for comparative analysis

- Risk group I
  - Travel for ≥1 month
  - Approximates “Recommended”
- Risk group II
  - Travel <1 month but planning to spend >20% time doing outdoor activities in rural areas
  - Approximates “Consider”
- Risk group III
  - Remainder of U.S. travelers to Asia

Incidence estimates by risk group

Risk group	Number of JE cases*	Proportion of travelers†	Number of travelers‡	Incidence (per million)
I	5	19.5%	9.38 million	0.53
II	3	25.4%	12.22 million	0.25
III	1	55.1%	26.50 million	0.04

*US surveillance data for 2007—2016

†Airport survey of US travelers to Asia (Duffy MR. J Travel Med 2013)

‡Estimated from total number of trips to Asia by US citizens from 2007–2016 (US National Travel and Tourism office)

Background on travel vaccine cost effectiveness studies

- No cost-effectiveness studies for use of JE vaccine among travelers
- ACIP has not considered cost effectiveness analyses for other rare travel-associated vaccine-preventable diseases (e.g., rabies, meningococcal disease)

JE vaccine cost-effectiveness studies in endemic countries

- JE vaccination is cost-effective or cost-saving for local populations in JE endemic countries
- Higher disease incidence in endemic areas
  - 1–10 cases per 100,000 population in endemic countries
  - <1 case per million US travelers
- Substantially lower cost vaccines used
  - <$1 per dose for live attenuated vaccine in endemic areas
  - $600 for 2-dose schedule for US travelers for JE-VC

Yin Z. Vaccine 2012; Touch S. Vaccine 2010; Liu W. Vaccine 2008; Suraratdecha C. J Pharm Fin 2006; Ding D. Bull WHO 2003; Campbell GL. Bull WHO 2011.

Previous ACIP work group decision

- In 2010, ACIP WG decided not to evaluate cost-effectiveness when considered current recommendations for US travelers
- Rationale
  - Clear not cost-effective due to low disease incidence and high vaccine cost
  - Travel vaccines usually paid for by travelers
  - Not covered under Vaccines for Children program or by most private insurers

CDC. MMWR Recomm Rep 2010.

Rationale for current comparative analysis

- Provide perspective on numbers needed to be vaccinated and cost per case averted
- Compare relative costs of vaccination for travelers with different itineraries and disease risk
- Understand the cost implications of possibly expanding the current JE vaccine recommendations to a broader group of travelers.